

**FACT SHEET FOR NPDES PERMIT WA0037290**

**FACILITY NAME: TAMOSHAN SEWAGE TREATMENT PLANT**

**SUMMARY**

The Tamoshan Treatment plant was originally constructed in 1973 and needs to be replaced. A new plant is about to be constructed and will be completed approximately two years into the new permit. The neighboring community of Beverly Beach also has an aging and inadequate treatment system. The flows from Beverly Beach will be rerouted into the new Tamoshan Plant. The final discharge is in the same location as the original Tamoshan Plant which is to the waters of Budd Inlet near the end of Cooper Point. This permit is written for both the old plant and the new plant.

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## INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 Revised Code of Washington (RCW) which defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<b><u>GENERAL INFORMATION</u></b>	
Applicant	Thurston County, Department of Water and Waste Management
Facility Name and Address	Tamoshan Wastewater Plant 2304 63 <sup>rd</sup> Avenue Northwest
Type of Treatment	<b>Old Plant:</b> Extended aeration, secondary treatment, with chlorination. <b>New Plant:</b> Sequencing Batch Reactor, extended aeration activated sludge, secondary treatment, with UV disinfection.
Discharge Location	Budd Inlet Latitude: 47° 07' 35" N                      Longitude: 122° 54' 52" W.
Water Body ID Number	47122B9C1

## **BACKGROUND INFORMATION**

### *DESCRIPTION OF THE FACILITY*

#### **HISTORY**

The original “old” plant was constructed in 1973 by installing a used “package” plant. The plant has been modified and updated over the years but has long outlived its life expectancy and is in consistent need of repair. The plant was originally run by the Tamoshan community association until 1976 when Thurston County was asked for assistance. The County has been operating and responsible for the facility ever since. In the late 1990s, the Department accepted a plan to shut down the Tamoshan and Beverly Beach waste water treatment works and pipe the waste water to the LOTT treatment plant in Olympia. However, the plan was put to an end when the proposal was successfully appealed to the state Growth Management Hearings Board. The next alternative was then pursued which was to replace the aging plants at Tamoshan and Beverly Beach with a new facility at Tamoshan. The new facility should begin construction in September 2002 and be completed between August 2003 and February 2004.

#### **COLLECTION SYSTEM STATUS**

The collection system dates to the 1970s when the plant was first installed. There are problems with several of the manhole vaults infiltrating with rain water during storms. The present upgrade does not include fixing all of these infiltration problems. However, some changes have to be made to the Beverly Beach system in order to connect to Tamoshan. The old Beverly Beach Treatment Works will be replaced with a pump station. Several manholes will be replaced or lined. There is currently a collection line in the Tamoshan system that runs along the beach serving beach cabins. There are at least two manholes in this collection line that are under water at high tide. This collection line will be replaced during the permit cycle with new collection lines that will pump wastewater upland from each beach cabin rather than down to the beach.

#### **TREATMENT PROCESSES**

The old Tamoshan system consists of two extended aeration type of units, one clarifier, a chlorine contact chamber and an effluent pump. The flow is divided via a manhole which is not very effective. Due to poor flow-splitting, about 75 percent of the flow enters one of the aeration units. The Tamoshan system serves 95 residences. The Beverly Beach system is covered under Permit Number WA0038067 and will continue under that permit until the collection service area is connected and the effluent is pumped to the new Tamoshan facility. This permit (for Tamoshan) will then cover both communities and the Beverly Beach permit will be cancelled. The Beverly Beach system serves 22 residences with an old plant capable of extended aeration.

The new Tamoshan system will consist of an influent structure with a rotating fine screen auger or an optional bar screen; an influent Parshall flume with ultrasonic flow meter; an equalization basin; two sequencing batch reactors (SBRs) capable of extended aeration activated sludge; ultra-violet (UV) disinfection; a sludge digester/holding tank; and the existing building will be rebuilt to house new electrical equipment and will include a new emergency generator. Tamoshan and Beverly Beach combined will serve a total of 117 residences.

#### **DISCHARGE OUTFALL**

Secondary treated and disinfected effluent is discharged from the facility via an outfall that is approximately 750 feet long into Budd Inlet in water that is approximately 41 feet deep at MLLW.

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**RESIDUAL SOLIDS**

The treatment facilities remove solids during the treatment of the wastewater which includes the solids removed at the headworks (grit and screenings), sludge removed from the SBRs or the sludge holding basins, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local transfer station. Solids removed from the SBR clarifier are treated using the aerobic digester on-site and land applied off-site as biosolids under the State Wide General Permit for Biosolids Handling.

*PERMIT STATUS*

The previous permit for **Tamoshan** was issued on October 20, 1986, and was extended on May 20, 1993. The previous Tamoshan permit placed effluent limitations on five-day Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria. An application for the Tamoshan permit renewal was submitted to the Department on March 5, 1998.

The previous permit for **Beverly Beach** was issued on March 21, 1991, and was extended on January 15, 1997. The previous Beverly Beach permit placed effluent limitations on flow, BOD<sub>5</sub>, TSS, Fecal Coliform, and pH. An application for the Beverly Beach permit was submitted to the Department on September 11, 2000. As noted earlier, the Beverly Beach permit will remain in effect until the new Tamoshan facility is operational and Beverly Beach flow has been rerouted. The old Beverly Beach permit may then be cancelled.

*SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT*

The Tamoshan facility received its last inspection on March 23, 1998. At that time the facility had mostly been in compliance for the previous three years with occasional violations for TSS, fecal coliform, and pH. An examination of recent records shows that the facility has continued the same track record for the last three years.

The Beverly Beach facility received an extensive inspection that lasted from January 22-24, 2002. Water quality sampling was conducted and the facility did not meet limits for fecal coliform. Over the past three years the plant has had difficulty meeting limits for BOD, TSS, and fecal coliform.

This permit does not go into great detail on the compliance record because both facilities will be replaced with the new Tamoshan facility within two years time.

*WASTEWATER CHARACTERIZATION*

There will be changes in the final quality of the wastewater with the new Tamoshan facility. However, the main difference will be reliability and the ability of the plant to meet the limits in the permit. For the Old Tamoshan facility and the Beverly Beach facility, the concentration of pollutants in the discharge was reported in the NPDES application and in Discharge Monitoring Reports (DMRs). The effluent is characterized as follows:

**Table 1: Old Tamoshan Wastewater Characterization (from 1998 permit application)**

<u>Parameter</u>	<u>Annual Average Concentration</u>	<u>Highest Monthly Average</u>
pH	6.8 avg low - 7.4 avg high	
Temperature	14°C avg winter – 17°C avg summer	13°C Winter 19°C Summer
Fecal coliform		188 col/100 ml
BOD <sub>5</sub>	11 mg/L	19 mg/L
TSS	19 mg/L	25 mg/L

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Total residual chlorine	3.77 mg/L	5.3 mg/L
Dissolved Oxygen	1.6 mg/L	0.6 mg/L avg low 2.5 mg/L avg high
Flow	0.0269 mgd	0.034 mgd

Fecal coliform appears to be the only parameter that has regularly exceeded limits. For the remaining two years that the old Tamoshan facility is in operation, the fecal coliform will have to be closely monitored. The new Tamoshan facility will be able to maintain lower TSS and will use UV disinfection, two things that should result in lower fecal coliform values.

Toxic pollutants were not monitored. Because of the small size of this community and because it is completely residential, there is very little likelihood of toxic pollutants in the effluent.

*SEPA COMPLIANCE*

In order for the new Tamoshan facility to be constructed the Thurston County Department of Water and Waste Management needed to comply with the State Environmental Protection Act (SEPA). A SEPA checklist was completed on November 15, 2001. Because the new facility is being built over the existing (old) site, there will be very little disturbance of new soils. Other government approvals or permits that will be needed for the proposal include:

- Thurston County Shoreline Master Program Substantial Development Permit.
- Thurston County Critical Area Review.
- Wastewater Facilities Plan Amendment
- Wastewater Facilities Design.
- Corps of Engineers 404 and Section 10 permit

Most of these permits or approvals have been completed. However, shoreline approval from Thurston County and the Department had yet to be obtained as of the drafting of this fact sheet.

**PROPOSED PERMIT LIMITATIONS**

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the

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conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

*DESIGN CRITERIA*

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the *Cooper Point Wastewater Facilities Plan Amendment*, (Cosmopolitan, 2002) as follows:

**Table 2: Design Standards for Beverly Beach and the Old and New Tamoshan WWTPs.**

Parameter	Design Quantity		
	Beverly Beach	Old Tamoshan	New Tamoshan
Monthly average flow (max. month)	0.014 MGD	0.036 MGD	0.050 MGD
Instantaneous peak flow			0.090 MGD
BOD <sub>5</sub> influent loading (annual avg)			70 lbs/day
BOD <sub>5</sub> influent loading (max month avg)	14 lbs/day	58.4 lbs/day	105 lbs/day
TSS influent loading	14 lbs/day	58.4 lbs/day	105 lbs/day
Ammonia, max monthly avg			10 lbs/day
Design residential equivalents	22	95	117

The design flow and design population for the new Tamoshan facility is based on the combined flows and the combined population of Beverly Beach and the old Tamoshan facility. The improved technology of the SBR system will allow the new Tamoshan facility to meet a higher design BOD and TSS influent loading than the combined design values of the Beverly Beach and Tamoshan loadings.

*TECHNOLOGY-BASED EFFLUENT LIMITATIONS*

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD<sub>5</sub>, and TSS are taken from Chapter 173-221 WAC are:

**Table 3: Technology-based Limits.**

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL



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<b>Parameter</b>	<b>Limit</b>
BOD <sub>5</sub> (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine*	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

\* The old Tamoshan permit did not have a chlorine residual limit. The new permit will have an interim limit of 0.5 mg/L chlorine residual. After two years when the new plant is built with UV disinfection, the permit will not have a chlorine residual limit since chlorine will no longer be used.

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/L chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding maximum daily is 0.75 mg/L.

The following technology-based mass limits for BOD and TSS are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings for BOD and TSS (lbs/day) were calculated as the maximum monthly design flow (0.050 MGD) x Concentration limit (30 mg/L) x 8.34 (conversion factor) = mass limit 13 lbs/day.

The weekly average effluent mass loading for BOD and TSS is calculated as 1.5 x monthly loading = 20 lbs/day.

*SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS*

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL). Outer Budd Inlet near the Tamoshan discharge is listed on the 303(d) list dissolved oxygen and pH. A TMDL has not been conducted for these parameters. More will be discussed later under BOD and pH below.

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NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the state Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The ambient conditions were established by the consultant for the Permittee (Cosmopolitan, 2002) using ambient data from the Department's on-line database, existing reports, and previous outfall analysis. The ambient data for the examination of ammonia and other criteria used 5<sup>th</sup> and 95<sup>th</sup> percentile values. Effluent data for ammonia or metals was not available. Therefore, data from similar communities (Vashon Island and Buckley) were used as representative data. These facilities use extended aeration activated sludge and serve primarily domestic areas. Ammonia, arsenic, cadmium, copper, lead, mercury, nickel, silver, and zinc were analyzed.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the

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numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

#### DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Budd Inlet which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls include Beverly Beach which will be discharged through the old Tamoshan outfall after being treated in the new Tamoshan facility. The next nearest outfall is for Boston Harbor which is more than a mile away and outside the mouth of the Inlet. The outfall for the Lacey Olympia Tumwater Thurston (LOTT) wastewater treatment works is more than four miles away. There do not appear to be any significant nearby non-point sources of pollutants. Households outside of the Tamoshan and Beverly Beach communities treat their waste with individual on-site septic systems, some of which could be failing, however, no failing septic systems have been identified at this time. Characteristic uses of the Class A waters include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

#### SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA, 1992). Criteria for this discharge are summarized below:

**Table 4: Surface Water Quality Standards for Class A Marine Waters**

Fecal Coliform	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	6 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

#### CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of PLUMES model. To obtain the modeled dilution values, the PLUMES

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model was run 36 times with minimum and maximum current velocities from 1985 through 2000. The minimum acute and chronic dilution values were chosen from the model runs.

Model acute value = 71, Model chronic value = 311

The engineer consultant for the Permittee (Cosmopolitan, 2002) determined an initial modeled chronic dilution factor of 311. However, because the proposed treatment technology will be an SBR facility, the discharge will be intermittent which allows for an adjustment according to the Department policy (Washington, 1994, Appendix 6:1.2). The dilution factor was adjusted by applying a ratio of peak hourly flow to the maximum four day average.

The adjusted chronic dilution factor= modeled dilution factor (peak hourly flow/Max four-day average flow).

$$311(0.18/0.07) = 800$$

The dilution final factors have been determined to be (from Appendix C):

	Acute	Chronic
Aquatic Life	71	800

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the outfall and the ambient background data used for this permit includes the following from (Cosmopolitan, 2002) which drew on several sources which included an outfall study conducted by EarthTech in 1998, NOAA marine studies from 1986 and the Department on-line data:

**Table 5: Critical Ambient Conditions**

Parameter	Value used
Current Velocity (fps)	Acute 0.066 ft/sec min – 1.05 ft/sec max Chronic 0.46 ft/sec median
Effluent flow (mgd)	0.18 mgd
Outfall Depth	41 feet
Outfall Diameter	0.5 feet
Outfall Length	745 feet from shore
Temperature	18.1° C
pH (high)	8.6
Dissolved Oxygen	6.7 mg/L

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Total Ammonia-N	82.2 µg/L
Fecal Coliform	12.9 col./100 mL
Salinity	24.3 g/kg
Arsenic	0.0 µg/L
Cadmium	0.994 µg/L
Copper	0.74 µg/L
Lead	0.01 µg/L
Mercury	0.0 µg/L
Nickel	0.66 µg/L
Silver	0.0 µg/L
Zinc	0.51 µg/L
All Other Metals	0.0 (below detection limits)

BOD<sub>5</sub>--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water. Because the discharge is to waters that are 303(d) limited for dissolved oxygen and no TMDL has been conducted, no net increase in the discharge of BOD will be allowed. Because the new facility will use the newer SBR technology, it is more likely that BOD will be lower and DO will be higher and thus much improved over the old facility.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 18.1°C and the effluent temperature is 18.1°C. The predicted resultant temperature at the boundary of the chronic mixing zone is 18.1°C and the incremental rise is 0.0°C.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters. The receiving water is 303(d) limited for pH. The Old Tamoshan facility showed two pH violations in 1998, however, the new SBR facilities typically have good compliance records for pH. The domestic nature of the wastewater is also typically very stable.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for pH was placed in the permit and temperature was not limited.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 800.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

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Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine (will be present in the old Tamoshan facility but not the new Tamoshan facility), ammonia, and heavy metals. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for (arsenic, cadmium, copper, lead, mercury, nickel, silver, and zinc) to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C). The parameters used in the modeling are as follows: acute dilution factor 71, chronic dilution factor 800, receiving water temperature 18.1°C, (ambient levels of metals may be found in the ambient and critical conditions table above).

Chlorine used for disinfection is also a toxic pollutant, however, the new Tamoshan facility will be using UV disinfection. The old permit did not have a chlorine limit. The permit will have a chlorine limit for the first two years after which there will be no limit so long as the facility has converted to UV disinfection. The limit will be technology based at 0.5 mg/L residual chlorine for an average monthly limit and 0.75 for a daily maximum limit. The old Tamoshan facility should be able to meet the residual chlorine limit at the edge of the mixing zone.

Valid ambient background data was available for the pollutants listed above. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

#### WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

#### HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

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The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health, and is undergoing technology-based upgrades and thus should be regulated for human health based criteria only after upgrades are completed. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

**SEDIMENT QUALITY**

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

*GROUND WATER QUALITY LIMITATIONS*

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

*COMPARISON OF EXISTING & PROPOSED PERMIT LIMITS*

Parameter	Existing Limits	Proposed Limits	
		Interim Limits	Final Limits
BOD <sub>5</sub> , TSS (monthly avg)	30 mg/L, 9.0 lbs/day	30 mg/L, 9.0 lbs/day	30 mg/L, 13 lbs/day 85% removal (mg/L)
BOD <sub>5</sub> , TSS (weekly avg)	45 mg/L, 13 lbs/day	45 mg/L, 13 lbs/day	45 mg/L, 20 lbs/day
Fecal coliform (monthly avg)	200 mg/L	200 mg/L	200 mg/L
Fecal coliform (weekly avg)	400 mg/L	400 mg/L	400 mg/L
pH	6.0 – 9.0 standard units	6.0 – 9.0 standard units	6.0 – 9.0 standard units
Total residual chlorine (monthly avg)		0.5 mg/L	
Total residual chlorine (weekly avg)		0.75 mg/L	

**MONITORING REQUIREMENTS**

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is

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consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for a facility with average design flow that is less than 0.1 mgd.

*LAB ACCREDITATION*

The exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The samples from the Tamoshan facility are processed at the Boston Harbor Wastewater Facility or the Grand Mound Wastewater Facility, which are accredited for: TSS, BOD, pH, and dissolved oxygen. Fecal coliform samples are analyzed at the Grand Mound Wastewater Treatment Facility. Both of these facilities including Tamoshan are run by the Thurston County Public Works.

**OTHER PERMIT CONDITIONS**

*REPORTING AND RECORDKEEPING*

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

*PREVENTION OF FACILITY OVERLOADING*

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

*OPERATION AND MAINTENANCE (O&M)*

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

*RESIDUAL SOLIDS HANDLING*

To prevent water quality problems the Permittee is required in permit Condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503 and is covered under the Statewide General Permit for Biosolids Management. The disposal of other solid waste is under the jurisdiction of the Thurston County Health Department.

Requirements for monitoring sewage sludge and recordkeeping are not included in this permit, but are included in the Statewide General Permit for Biosolids Management administered by the Solid Waste Program at the Department. This information will be used by the Department to develop or update local limits and is also required under 40 CFR 503.



*OUTFALL EVALUATION*

Proposed permit Condition S.8 requires the Permittee to conduct an outfall inspection once during the permit and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

*GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

**PERMIT ISSUANCE PROCEDURES**

*PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

*RECOMMENDATION FOR PERMIT ISSUANCE*

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

## REFERENCES FOR TEXT AND APPENDICES

### Cosmopolitan Engineering Group

2002 (November 2001, revised December 2001, Revised January 2002) , Cooper Point Wastewater Facilities Plan Amendment. Tacoma, Washington.

### Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

### Esvelt, H.R., Engineering and Cosmopolitan Engineering Group

2002. Tamoshan Wastewater Treatment Plant Improvements. (Engineering drawings, schematics and maps). Bainbridge Is., Washington; Tacoma Washington.

### Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

### Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

### Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

### Water Pollution Control Federation.

1976. Chlorination of Wastewater.

### Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

## APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on August 19, 2001, August 26, 2001, July 14, 2002, and July 21, 2002, in the *Daily Olympian* to inform the public that an application had been submitted and to invite comment on the issuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on August 8, 2002, in the *Daily Olympian* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Carey Cholski  
Water Quality Permit Coordinator  
Department of Ecology  
Southwest Regional Office  
P.O. Box 47775  
Olympia, WA 98504-7775.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6554, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

## APPENDIX B--GLOSSARY

**Acute Toxicity**--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

**AKART**-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation** --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

**Average Weekly Discharge Limitation** -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**CBOD<sub>5</sub>** – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celcius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD<sub>5</sub> is given in 40 CFR Part 136.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Combined Sewer Overflow (CSO)**--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** --Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Industrial User**-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Infiltration and Inflow (I/I)**--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

**Interference** -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

**Major Facility**--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**Minor Facility**--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone**--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

**Pass through** -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Potential Significant Industrial User**--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

**Quantitation Level (QL)**-- A calculated value five times the MDL (method detection level).

**Significant Industrial User (SIU)**--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority\* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority\* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

\*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

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**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.



## APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel<sup>®</sup> spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

Calculation of seawater fraction of un-ionized ammonia  
from Hampson (1977). Un-ionized ammonia criteria for  
salt water are from EPA 440/5-88-004.

Based on Lotus File NH3SALT.WK1 Revised 19-Oct-93

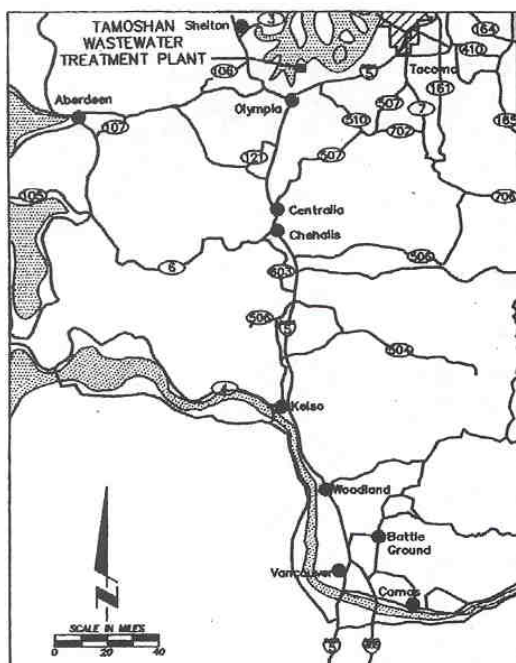
INPUT	
1. Temperature (deg C):	18.1
2. pH:	8.6
3. Salinity (g/Kg):	24.3
OUTPUT	
1. Pressure (atm; EPA criteria assumes 1 atm):	1.0
2. Molal Ionic Strength (not valid if >0.85):	0.496
3. pKa8 at 25 deg C (Whitfield model "B"):	9.303
4. Percent of Total Ammonia Present as Unionized:	10.595%
5. Unionized ammonia criteria (mg un-ionized NH <sub>3</sub> per liter) from EPA 440/5-88-004	
Acute:	0.233
Chronic:	0.035
6. Total Ammonia Criteria (mg/L as NH <sub>3</sub> )	
Acute:	2.20
Chronic:	0.33
7. Total Ammonia Criteria (mg/L as NH <sub>3</sub> -N)	
Acute:	1.81
Chronic:	0.27

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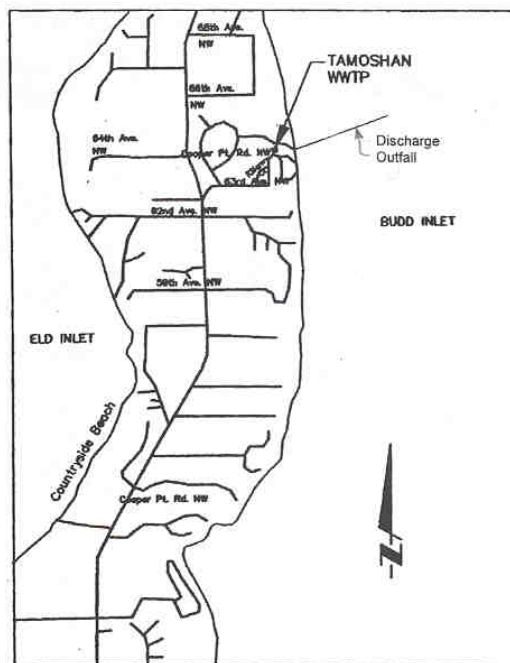
Reasonable Potential Calculations								
Reprinted from (Cosmopolitan, 2002).								
				State Water Quality Standard		Max concentration at edge of...		
	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Concentration (metals as dissolved)			Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?
Parameter	Acute	Chronic	ug/L	ug/L	ug/L	ug/L	ug/L	
Ammonia - N			82.2000	1810.00	270.00	104.68	84.19	NO
Arsenic	1.00		0.0	69.00	36.00	0.71	0.06	NO
Cadmium	0.99	0.99	0.1000	42.00	9.30	0.16	0.11	NO
Copper	0.83	0.83	0.7400	4.80	3.10	1.10	0.77	NO
Lead	0.95	0.95	0.0100	210.00	8.10	0.05	0.01	NO
Mercury	0.85		0.0	1.80	0.025	0.02	0.00	NO
Nickel	0.99	0.99	0.6600	74.00	8.20	1.07	0.70	NO
Silver	0.85	0.85	0.0	1.90	10000.00	0.07	0.01	NO
Zinc	0.95	0.95	0.5100	90.00	81.00	2.01	0.64	NO
Chlorine			0.0	13.0	7.5	10.99	0.98	NO

REASONABLE POTENTIAL CALCULATIONS CONTINUED									
	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samples	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter		Pn	ug/L	CV	s	n			
Ammonia - N	0.95	0.762	1000.00	0.60	0.55	11	1.68	71	800
Arsenic	0.95	0.652	25.00	0.60	0.55	7	2.01	71	800
Cadmium	0.95	0.368	1.50	0.60	0.55	3	3.00	71	800
Copper	0.95	0.936	31.80	0.60	0.55	45	1.00	71	800
Lead	0.95	0.368	1.00	0.60	0.55	3	3.00	71	800
Mercury	0.95	0.847	1.00	0.60	0.55	18	1.41	71	800
Nickel	0.95	0.368	10.00	0.60	0.55	3	3.00	71	800
Silver	0.95	0.368	2.00	0.60	0.55	3	3.00	71	800
Zinc	0.95	0.933	104.50	0.60	0.55	43	1.09	71	800
Chlorine	0.95	0.926	699.00	0.60	0.55	39	1.12	71	800

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TAMOSHAN SEWAGE TREATMENT PLANT



VICINITY MAP

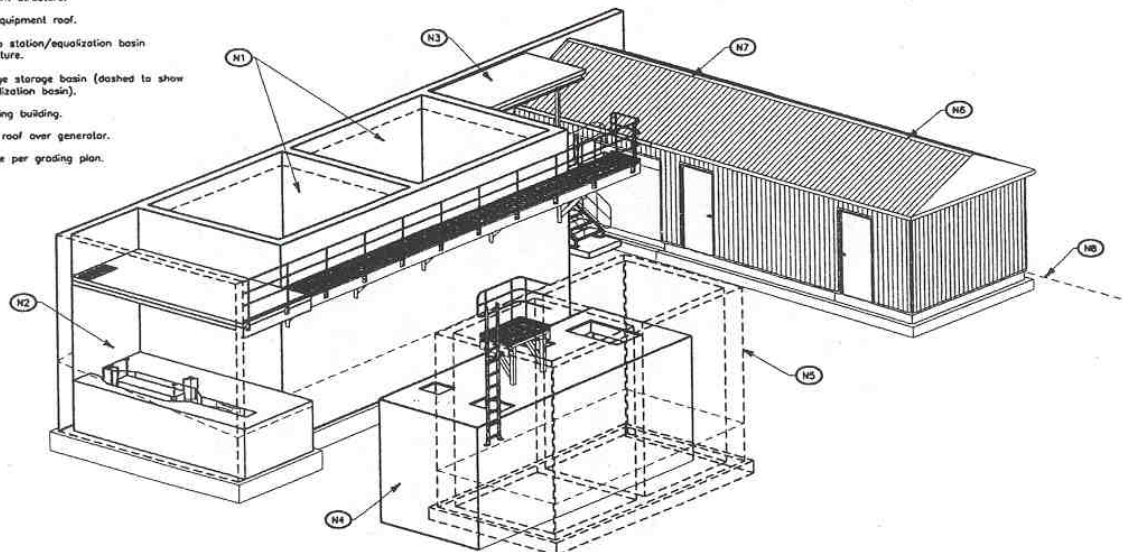


LOCATION MAP

Proposed New Tamoshan Wastewater Treatment Plant

NOTES (for this isometric)

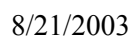
- (N1) SBR basins.
- (N2) Influent structure.
- (N3) UV equipment roof.
- (N4) Pump station/equalization basin structure.
- (N5) Sludge storage basin (dashed to show equalization basin).
- (N6) Existing building.
- (N7) New roof over generator.
- (N8) Grade per grading plan.



ISOMETRIC VIEW FROM SOUTH WEST

NO SCALE

NOTE  
Overall isometric views are provided for a general overview of the project. Not all existing conditions are shown, nor all new work to be done. Refer to specific discipline sheets for detailed requirements of the work to be done. Field verify all existing conditions.



## APPENDIX D--RESPONSE TO COMMENTS

### Comments from the Squaxin Island Tribe and responses from the Department of Ecology.

The Squaxin Island Tribe commented on the draft permit on October 15, 2002.

#### 1. Comment:

Why is there additional loading to the plant when it is being constructed to serve existing households? We recognize that the permit does not specifically limit loading, however, it is our understanding that the facility is being designed for just the Tamoshan and Beverly Beach communities. Their existing loadings for BOD<sub>5</sub> total just over 70 pounds per day, yet the new plant is designed for 105 pounds per day, a 50 percent increase. If improvements are in fact being made to the collection system it should increase efficiency and reduce flows resulting in the ability to design for a smaller loading.

#### Response:

The new Tamoshan plant does have a larger capacity to treat an increased BOD and TSS load beyond the combined load of the Tamoshan and Beverly Beach communities. The old Tamoshan plant was limited in its treatment capability. However, the final limits will not go beyond the combined load of both the old Tamoshan and the Beverly Beach plants. What the facility is designed for and what the facility is limited to are two different things. The Department views the increased design capacity as a safety buffer and as a good idea in the case of seasonal and storm loading. An error was noted in the draft permit in the calculation of the mass based limits. The final effluent limits for BOD<sub>5</sub> and TSS will be modified, and therefore, do not go above the combined mass limits of the old plants as shown in strike-out and the correction in bold below:

Parameter	Average Monthly	Average Weekly
BOD	30 mg/L, <del>43</del> <b>11</b> lbs/day 85% removal	45 mg/L, <del>20</del> <b>16</b> lbs/day
TSS	30 mg/L, <del>43</del> <b>11</b> lbs/day 85% removal	45 mg/L, <del>20</del> <b>16</b> lbs/day

#### 2. Comment:

How does the Department justify additional loading of BOD<sub>5</sub> in the effluent discharge to a marine environment that already fails to meet water quality standards and is on the 303(d) list? The intent of the Clean Water Act is to reduce discharges and clean up waterways, not increase discharge levels of pollutants that diminish water quality. This proposed permit proposes to increase the loading of pollutants over existing levels in an already polluted environment. This is not acceptable.

#### Response:

As noted above the BOD<sub>5</sub> and TSS loading will not increase. The water quality standards and 303(d) listing are for dissolved oxygen and not BOD. There will not be an increase in the BOD loading from this facility. The facility design should do a better job in reducing BOD loading and have a higher dissolved oxygen effluent than the old facilities.

**3. Comment:**

Why is the anti-degradation policy not being applied? With the additional loading of BOD<sub>5</sub> noted above, the Department seems to be in violation of the anti-degradation policy established to protect waters from getting worse. Particularly when a pollutant already exceeds the water quality standard, more loading will make conditions worse.

**Response:**

As noted above, under the response to the first comment, the BOD and TSS loading will not increase from the original loading. It is also unlikely that a slight increase in BOD loading would cause a measurable impact on the dissolved oxygen in Budd Inlet. It should also be noted that the facility meets AKART and would likely continue to support all existing beneficial uses if BOD were increased. What is more likely is that the facility will discharge less BOD and have a higher dissolved oxygen output than the old facilities and will thus be reducing the loading to Budd Inlet.

**4. Comment:**

Why must the discharge dilution be adjusted and include the use of a dilution zone? In Budd Inlet it is a known fact that circulation is slow and accordingly dilution becomes a critical factor. Manipulating the chronic dilution values and applying a discharge zone where water quality standards are essentially waived is not in the best interest of protecting water quality. Budd Inlet has chronically depressed DO values that are aggravated by the discharge of BOD<sub>5</sub>/TSS that consumes oxygen. Creating a zone where this violation of water quality is acceptable is not in keeping with the intent of the Clean Water Act.

**Response:**

A mixing zone is allowed under the federal and state regulations. The calculation of the dilution factors and the size of the mixing zone followed the regulations and the policies adopted for calculating the dilution and mixing zone. The parameters used in determining a dilution factor take into account the local conditions of current, temperature, salinity, and depth of water over the diffuser.

**5. Comment:**

Why are you issuing a permit for a facility that hasn't been built yet? While the existing facility clearly needs a renewed permit to continue operating, a new facility has not met final approval and should thus be considered speculative. Issuing a permit for speculative new discharge, particularly one that proposes to exceed current discharge design criteria and threaten water quality, is beyond the scope of the Clean Water Act.

**Response:**

A new facility must have a permit before operating. The permit process allows public comment to occur before operation is allowed to start. Likewise the permit process requires engineering review of the proposed facility to take place before the new permit is issued and the facility begins operation. The engineering review of the facility plan has been completed and conditionally approved by the Department engineers pending permit approval. This process is



*FACT SHEET FOR NPDES PERMIT WA0037290*  
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spelled out in the federal regulations 40 CFR part 122 which implements the Clean Water Act and is administered by the states. The implementation by the state of Washington for the NPDES permit process is spelled out in WAC 173-220.

The Department has decided to issue a permit to Thurston County for the operation of the Tamoshan facility.